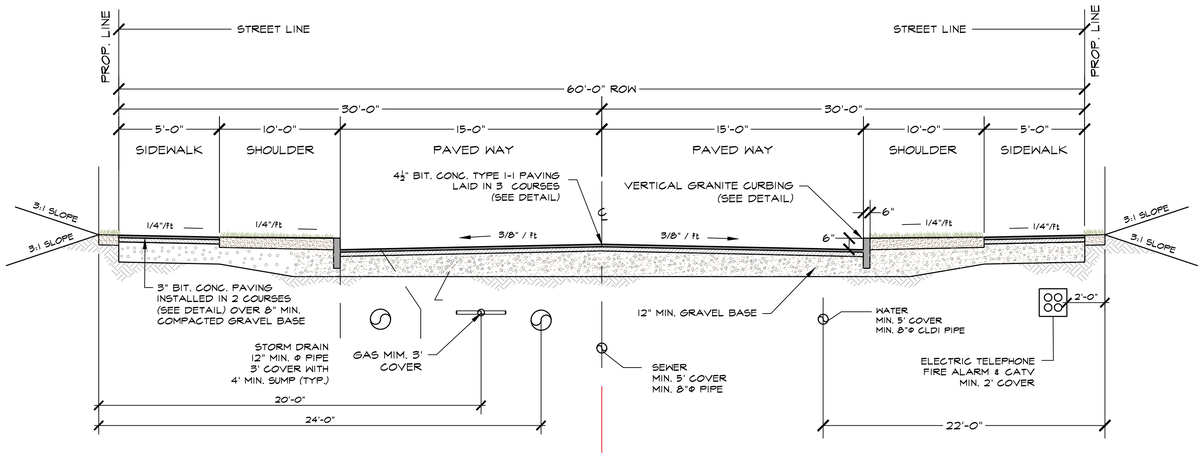
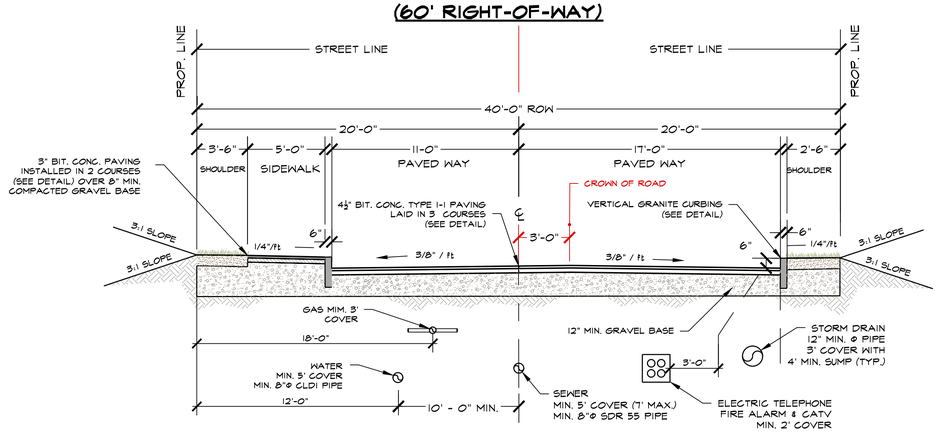
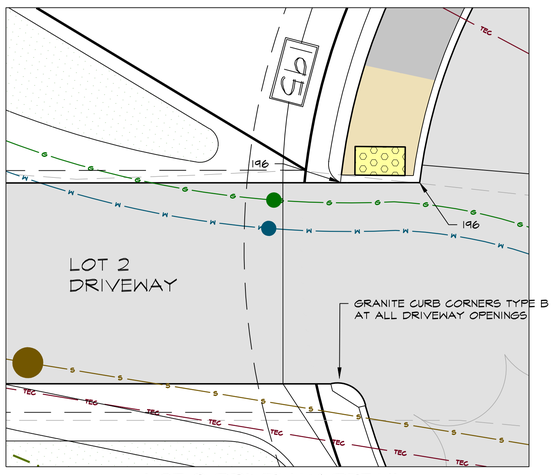



## TOWN OF READING TYPICAL CROSS SECTION (60' RIGHT-OF-WAY)

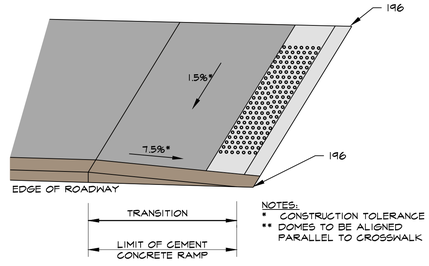



## PROPOSED CROSS SECTION (40' RIGHT-OF-WAY)



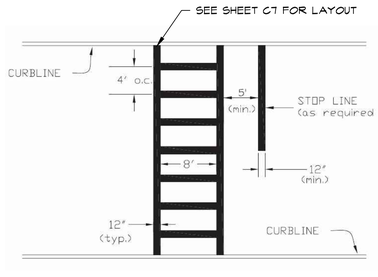

## LOT 2 DRIVEWAY DETAIL

SCALE: 1"=5'




## WHEELCHAIR RAMP - SIDEWALK TERMINATION

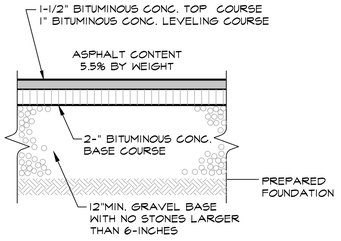
NOT TO SCALE




## TYPICAL CROSSWALK AND STOP LINE - OPEN SPACE PATH

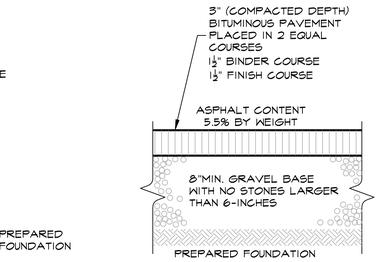
NOT TO SCALE

| SIGN | SIGN DESIGNATION | SIGN SIZES |
|---|---|---|
| STOP | R1-1 | 30" X 30" |




## TYPICAL PAVEMENT SECTION

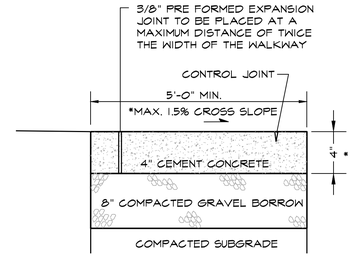
NOT TO SCALE




## SIDEWALK & DRIVE APRON PAVEMENT SECTION

NOT TO SCALE

NOTE:
ALL DRIVEWAY APRONS TO CONSTRUCTED UP TO AND WITHIN THE (PROPOSED) ROW

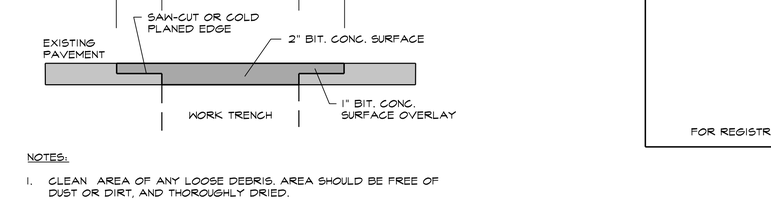



NOTE: CEMENT CONCRETE STRENGTH 4000 PSI W/ 5% TO 7% AIR ENTRAINMENT

## CONCRETE SIDEWALK DETAIL

NOT TO SCALE

* CONCRETE TO BE 5" @ THE ATTACHED RAMPS

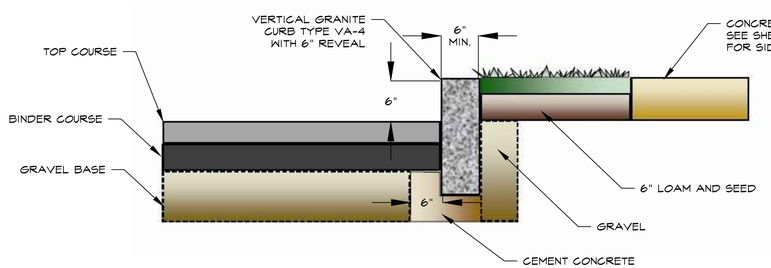



NOTES:

1. CLEAN AREA OF ANY LOOSE DEBRIS. AREA SHOULD BE FREE OF DUST OR DIRT, AND THOROUGHLY DRIED.
2. A TACK COAT OF EMULSIFIED ASPHALT SHALL BE APPLIED TO THE SAW CUT AREA PRIOR TO PAVING.

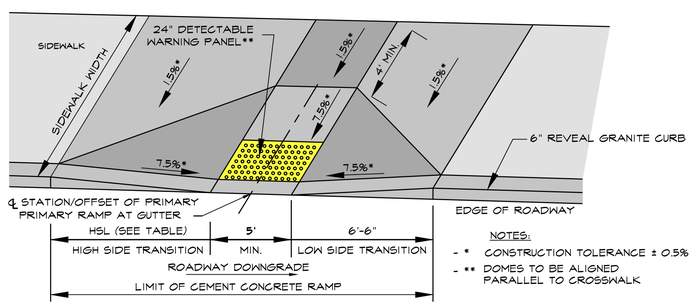
## PAVEMENT SAW-CUT

NOT TO SCALE




## VERTICAL GRANITE CURB

NOT TO SCALE




## WHEELCHAIR RAMP DETAIL

FOR REGISTRY USE ONLY

ASB
design group, LLC
civil engineering
traffic engineering
architecture
landscape design & construction
363 boston street, route 1
topsfield, ma 01983

project title:

ALFRED E. PETERSON WAY

prepared for:

JAMIESON PROPERTIES LLC
627 MAIN STREET, SUITE 1
WOBURN, MA 01801

revisions

| no. | date | description |
|---|---|---|
| 0 | 04.04.16 | ISSUED FOR REVIEW |
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| | | |

plan submission

DEFINITIVE SUBDIVISION PLAN AND NOTICE OF INTENT

date: 04.04.2016
scale: NOT TO SCALE
job no: 2014-17
DEP no: TBD

COMMONWEALTH OF MASSACHUSETTS
Thad D Berry
No. 41258
CIVIL
REGISTERED PROFESSIONAL ENGINEER

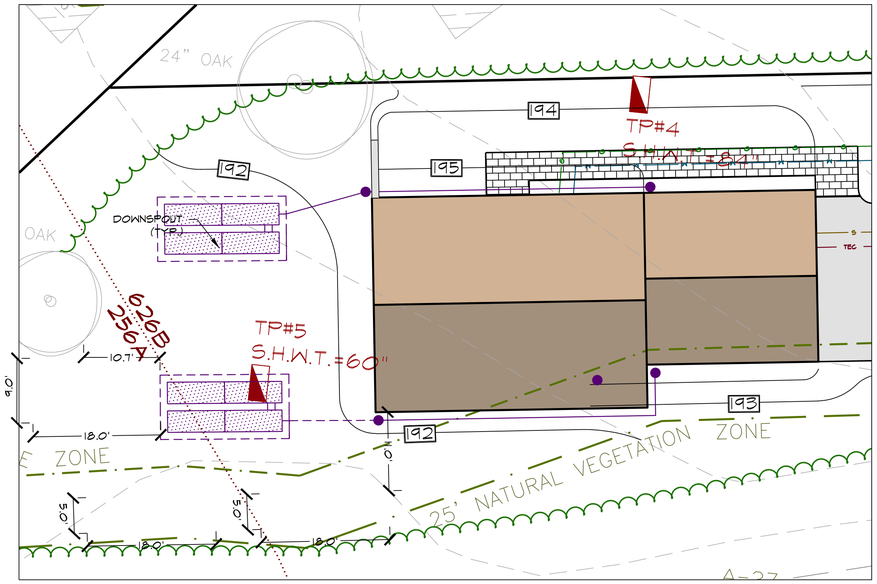
drawing name

SITE DETAILS

drawing number

C9

sheet 9 of 16




## LOT 2 ROOF RUNOFF INFILTRATION DETAIL

SCALE: 1"=5'

## INFILTRATION CALCULATIONS:

| TEXTURE CLASS | NRCS HYDROLOGIC SOIL GROUP (HSG) | INFILTRATION RATE (INCHES/HOUR) |
|---|---|---|
| SAND | A | 8.27 |
| LOAMY SAND | A | 2.41 |
| SANDY LOAM | B | 1.02 |
| LOAM | B | 0.52 |
| SILT LOAM | C | 0.27 |
| SANDY CLAY LOAM | C | 0.17 |
| CLAY LOAM | D | 0.09 |
| SILTY CLAY LOAM | D | 0.06 |
| SANDY CLAY | D | 0.05 |
| SILTY CLAY | D | 0.04 |
| CLAY | D | 0.02 |

### TOTAL INFILTRATION AREA:

2X5'X18' + 18'X9' = INFILTRATION AREA
180 S.F.' + 162 S.F.' = INFILTRATION AREA
342 S.F.' = INFILTRATION AREA

### TOTAL ROOF AREA:

LARGEST ROOF AREA LOT 2 = 2012 S.F.
ROOF AREA LOT 3 = 1888 S.F.
ROOF AREA LOT 4 = 1756 S.F.

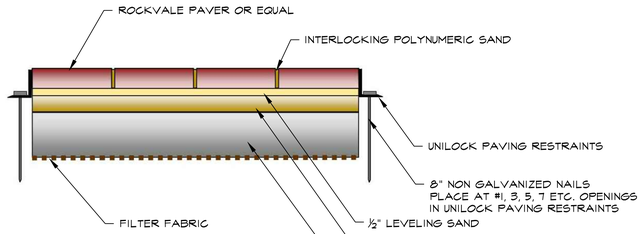
### INFILTRATION FOR ROOF ("STATIC" METHOD)

- INFILTRATION RATE: 8.27 IN/HR
- Q = (K) x (BOTTOM AREA OF ALL INFILTRATION SYSTEMS)
- Q = (8.27 IN/HR) x (342 S.F. SYSTEM) x $\frac{(1' \times 1\ HR)}{(12'' \times 3600\ sec)}$
- Q = 0.065 cfs SAY 0.06 cfs

IF DOWN SPOUTS ARE NOT USED THE CONTRACTOR SHALL INSTALL A STONE DRIP EDGE (12" WIDE MINIMUM) AT ALL ROOF DRIP EDGES THAT DISCHARGES STORMWATER ROOF RUNOFF.

### INFILTRATION:

INFILTRATION SYSTEM INFILTRATES 100 YEAR STORM EVENT (7.1" OF RAIN IN 24 HOURS). SEE PROJECT DATA REPORT - POST HYDROLOGY ROOF RUNOFF.




1. REMOVE ALL TOP AND SUBSOIL. COMPACT EXISTING SUB-BASE AND/OR CLEAN FILL. PLACE FILTER FABRIC.
2. PLACE AND COMPACT DENSE GRADED BASE MATERIAL.
3. PLACE, RAKE AND COMPACT WASHED SAND.
4. INSTALL PERVIOUS PAVER.
5. SWEEP POLYNUMERIC SAND INTO JOINTS AND WET WITH LIGHT WATER SPRY. LET SAND SET OVERNIGHT.
6. ADDITIONAL 8" NAILS MAYBE REQUIRED ON CURVES.

## PERVIOUS PAVER PATIO AND WALKWAY DETAIL

## Technical Information

### CULTEC Contactor® 100HD

The Contactor® 100HD is a 12.5" (318 mm) tall, low profile chamber and is typically used for installations with depth restrictions or when a larger infiltrative area is required. The Contactor 100HD has the side portal internal manifold feature. The HVLV™ SFCx2 Feed Connector is inserted into the side portal of the Contactor 100HD to create the internal manifold.

| | |
|---|---|
| Size (L x W x H) | 8' x 36" x 12.5" |
| | 2.44 m x 914 mm x 318 mm |
| Installed Length | 7.5' |
| | 2.29 m |
| Length Adjustment per Run | 0.5' |
| | 0.15 m |
| Chamber Storage | 1.87 ft³/ft |
| | 0.17 m³/m |
| | 14.00 ft³/unit |
| | 0.40 m³/unit |
| Min. Installed Storage | 3.84 ft³/ft |
| | 0.36 m³/m |
| | 28.81 ft³/unit |
| | 0.82 m³/unit |
| Min. Area Required | 25 ft² |
| | 2.32 m² |
| Min. Center to Center Spacing | 3.33' |
| | 1.02 m |
| Max. Allowable Cover | 14' |
| | 4.27 m |
| Max. Inlet Opening in Endwall | 10" |
| | 250 mm |
| Side Portal Dimensions (H x W) | 7" x 7.5" |
| | 178 mm x 191 mm |
| Max. Allowable Pipe Size in Side Portal | 6" |
| | 150 mm |
| Compatible Feed Connector | HVLV™ SFCx2 Feed Connector |

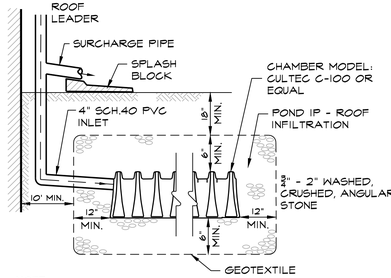
| | Stone Foundation Depth | | |
|---|---|---|---|
| | 6" | 12" | 18" |
| | 152 mm | 305 mm | 457 mm |
| Chamber and Stone Storage Per Chamber | 28.81 ft³ | 33.81 ft³ | 38.81 ft³ |
| | 0.82 m³ | 0.96 m³ | 1.10 m³ |
| Min. Effective Depth | 2.04' | 2.54' | 3.04' |
| | 0.62 m | 0.77 m | 0.93 m |
| Stone Required Per Chamber | 1.37 yd³ | 1.84 yd³ | 2.30 yd³ |
| | 1.05 m³ | 1.40 m³ | 1.76 m³ |

Calculations are based on installed chamber length.
Includes 6" (152 mm) stone above crown of chamber and typical stone surround.
Stone void calculated at 40%.

**Contactor® 100HD Bare Chamber Storage Volumes**

| Elevation | | Incremental Storage Volume | | Cumulative Storage | | |
|---|---|---|---|---|---|---|
| in. | mm | ft³/ft | m³/m | ft³ | m³ | ft³ | m³ |
| 12 | 305 | 0.009 | 0.001 | 0.068 | 0.002 | 13.995 | 0.396 |
| 11 | 279 | 0.067 | 0.006 | 0.503 | 0.014 | 13.928 | 0.394 |
| 10 | 254 | 0.110 | 0.010 | 0.825 | 0.023 | 13.425 | 0.380 |
| 9 | 229 | 0.139 | 0.013 | 1.043 | 0.030 | 12.600 | 0.357 |
| 8 | 203 | 0.159 | 0.015 | 1.193 | 0.034 | 11.558 | 0.327 |
| 7 | 178 | 0.174 | 0.016 | 1.305 | 0.037 | 10.365 | 0.294 |
| 6 | 152 | 0.184 | 0.017 | 1.380 | 0.039 | 9.060 | 0.257 |
| 5 | 127 | 0.192 | 0.018 | 1.440 | 0.041 | 7.680 | 0.217 |
| 4 | 102 | 0.203 | 0.019 | 1.523 | 0.043 | 6.240 | 0.177 |
| 3 | 76 | 0.203 | 0.019 | 1.523 | 0.043 | 4.718 | 0.134 |
| 2 | 51 | 0.203 | 0.019 | 1.523 | 0.043 | 3.195 | 0.090 |
| 1 | 25 | 0.223 | 0.021 | 1.673 | 0.047 | 1.673 | 0.047 |
| Total | | 1.666 | 0.173 | 13.995 | 0.396 | 13.995 | 0.396 |

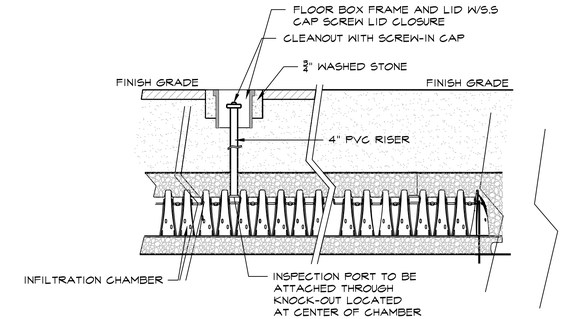
Calculations are based on installed chamber length.



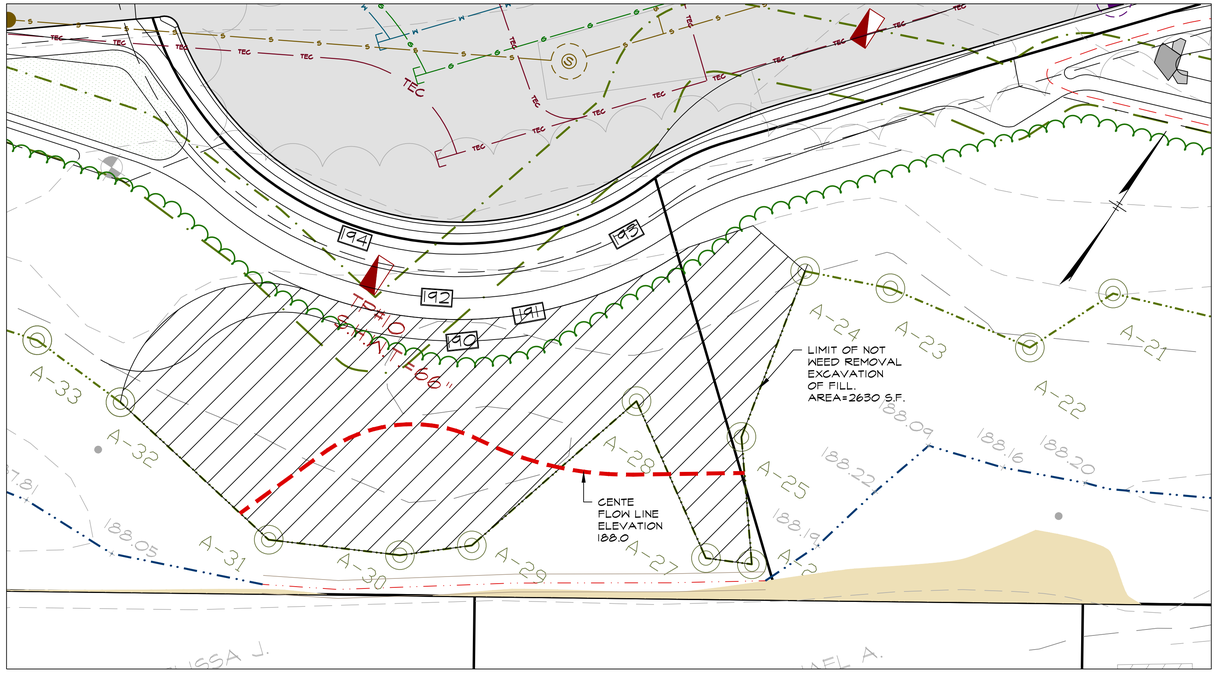

NOTE:
PLACE SCREEN AT INLET OF ROOF LEADER TO PREVENT LEAVES AND OTHER DEBRIS FROM DISCHARGING INTO THE ROOF LEADER.

## ROOF DRAIN INFILTRATION SYSTEM & OVERFLOW

NOT TO SCALE




## INSPECTION PORT DETAIL




## NOTES:

1. REMOVE AND DISPOSE NOT WEED (AREA = 2630 S.F.).
2. EXCAVATE AND REMOVE/DISPOSE FILL (AREA = 2630 S.F.).
3. ESTABLISH CENTER FLOW LINE (ELEV. = 188.0)
4. RE-VEGATATE AS DESCRIBE ON NOTICE OF INTENT BY WETLANDS MANAGEMENT INC.

## WETLAND RESTORATION DETAIL (NOT REED REMOVAL = 2630 S.F.)

SCALE: 1"=10'

FOR REGISTRY USE ONLY


ASB
design group, LLC
civil engineering
traffic engineering
architecture
landscape design & construction
363 boston street, route 1
topsfield, ma 01983


project title:

ALFRED E. PETERSON WAY

prepared for:

JAMIESON PROPERTIES LLC
627 MAIN STREET, SUITE 1
WOBURN, MA 01801

revisions

| no. | date | description |
|---|---|---|
| 0 | 04.04.16 | ISSUED FOR REVIEW |
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plan submission

DEFINITIVE SUBDIVISION PLAN AND NOTICE OF INTENT

date: 04.04.2016
scale: NOT TO SCALE
job no: 2014-17
DEP no: TBD

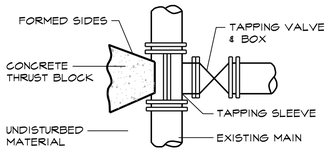
COMMONWEALTH OF MASSACHUSETTS
Thad D Berry
No. 41258
CIVIL
REGISTERED PROFESSIONAL ENGINEER

drawing name

SITE DETAILS

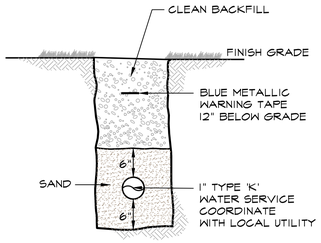
drawing number

C10



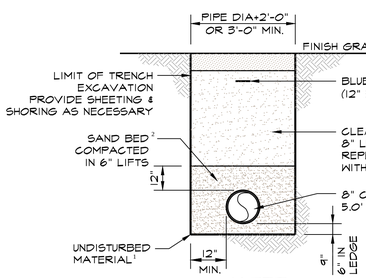

## TAPPING SLEEVE & VALVE DETAIL

NOT TO SCALE



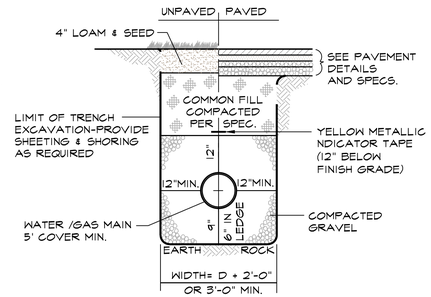

## WATER SERVICE TRENCH

NOT TO SCALE



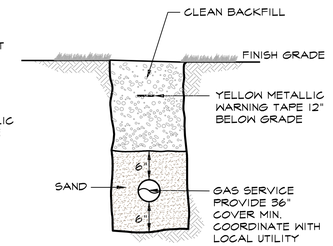

## WATER MAIN TRENCH

NOT TO SCALE




## GAS MAIN TRENCH

NOT TO SCALE




## GAS SERVICE TRENCH

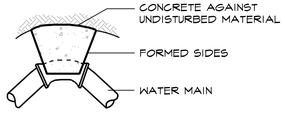
NOT TO SCALE

TRENCH NOTES:

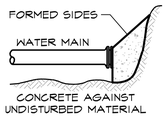
1) FIRM FOUNDATION SOILS (2000 PSI MIN.) REQUIRED. REPLACE UNSUITABLE SOILS WITH GRAVEL AS DIRECTED.

2) MHD M1.04.0 SAND SPEC. FOR WATER PIPE.

3) TRENCH TO CONFORM TO TOWN STANDARDS - CONTRACTOR TO CONFIRM.




## BEND-PLAN




## PLUG ELEVATION

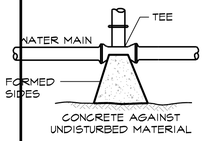
NOTE:

1) CONCRETE FOR THRUST BLOCKS SHALL HAVE A MINIMUM COMPREHENSIVE STRENGTH OF 2000 PSI AT 28 DAYS

2) THRUST BLOCK BEARING AREAS TO BE IN ACCORDANCE WITH TABLE BELOW, UNLESS DETERMINED OTHERWISE BY THE ENGINEER BECAUSE OF SOIL CONDITIONS

| TABLE OF BEARING AREAS (S.F.) | | | |
|---|---|---|---|
| SIZE OF MAIN (IN.) | 90° * BEND | TEES & * PLUGS | 45° BEND |
| 8± | 6 | 4 | 3 |
| 12 | 12 | 9 | 6 |
| | | | |
| | | | |

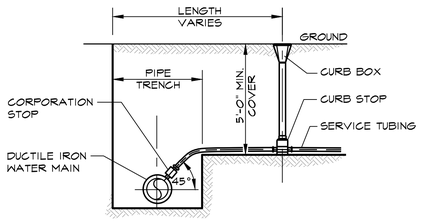
* RESTRAINED JOINTS ARE ALSO REQUIRED




## TEE-PLAN

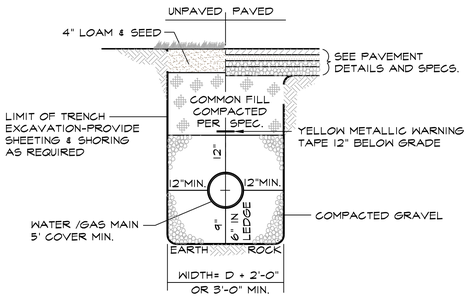
## THRUST BLOCK DETAILS

NOT TO SCALE




## TYPICAL WATER SERVICE

NOT TO SCALE




## UTILITY LINE TRENCH

NOT TO SCALE




## SEWER MAIN TRENCH

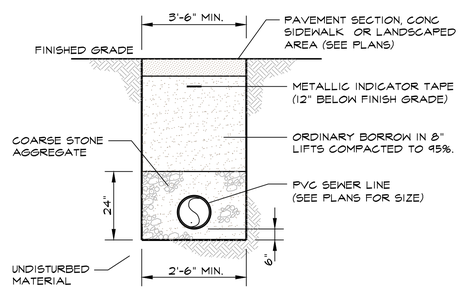
NOT TO SCALE

TRENCH NOTES:

1) FIRM FOUNDATION SOILS (2000 PSI MIN.) REQUIRED. REPLACE UNSUITABLE SOILS WITH GRAVEL AS DIRECTED.

2) MHD M2.01.7 CRUSHED STONE SPEC. FOR SEWER PIPE.

3) SEWER TRENCH TO CONFORM TO TOWN STANDARDS - CONTRACTOR TO CONFIRM.




## SEWER LINE TRENCH

NOT TO SCALE

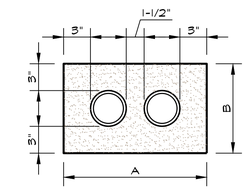



FIG. 1 2 - 4" DUCTS

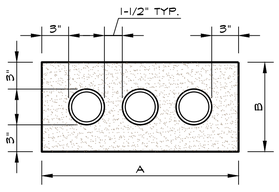



FIG. 2 3 - 4" DUCTS

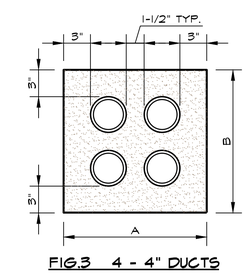



FIG.3 4 - 4" DUCTS

NOTES:

A. IN TRENCHES IN LEDGE, AN EARTH CUSHION SHOULD BE INSTALLED BETWEEN THE BOTTOM OF THE CONDUIT AND THE LEDGE WITH A MINIMUM THICKNESS OF TWO (2) INCHES. SIDE FORMS SHOULD ALSO BE USED SO THAT THE CONDUIT WILL BE ENTIRELY CLEAR OF THE LEDGE. THE FORMS SHOULD BE REMOVED AFTER THE CONCRETE HAS SET. THE BROKEN ROCK SHOULD NOT BE USED AS BACKFIELD UNDER ANY CIRCUMSTANCES.

B. MAINTAIN A CLEARANCE OF AT LEAST TWO (2) INCHES BETWEEN THE CONDUIT AND ALL FOREIGN STRUCTURES THAT CROSS EITHER ABOVE OR BELOW.

C. FOR SMALL CONDUIT LINES UNDER SPECIAL CONDITIONS WHEREVER LOCAL CONDITIONS PERMIT, APPROVED NON-METAL PIPE MAY BE LAID BARE.

D. CONCRETE MIX TO BE 3,000 PSI - 28 DAY STRENGTH WITH 1/2" MAXIMUM AGGREGATE.

E. ALL DUCT ARE TO BE 4".

F. ADDITIONAL CONDUIT CONSTRUCTION DETAILS ARE ILLUSTRATED IN U.G. STANDARD 2.10 - 2.1.

G. THE CONDUIT ON BRIDGES AND CULVERTS SHOULD BE ENCASED IN CONCRETE JOINTS BETWEEN IRON PIPE AND FIBER PIPE (OR OTHER PIPE) OF THE DUCT LINE SHOULD BE MADE IN THE EARTH FILL AND AT LEAST TEN (10) FEET FROM THE BRIDGE OR CULVERT ABUTMENTS. IN CASES OF MADE LAND THE IRON PIPES SHOULD EXTEND 25 FEET BEYOND THE ABUTMENTS. IN ALL CASES TERMINATE THE REINFORCING RODS FIVE (5) FEET BEYOND THE JOINT OF DISSIMILAR PIPES.

| MINIMUM QUANTITIES | | | |
|---|---|---|---|
| CONDUIT | FIBER OR PVC | | |
| | A | B | CUBIC YARDS CONCRETE PER LIN. FT. |
| FIG. 1 | 16 1/2" | 10 1/2" | .0363 |
| FIG. 2 | 22 1/2" | 10 1/2" | .0483 |
| FIG. 3 | 16 1/2" | 16 1/2" | .0536 |

## ELECTRIC CONDUITS

NOT TO SCALE

## UTILITY NOTES

1) ALL WORK ASSOCIATED WITH MAKING, REMOVING, OR REPAIRING A CONNECTION TO AN EXISTING STUB, OR THE CONSTRUCTION OF ANY NEW LINE, EXTENSION, OR CONNECTION MUST BE PERFORMED BY A DRAIN LAYER LICENSED BY THE TOWN.

2) AT THE TIME A CONNECTION IS MADE AND INSPECTED, IT IS THE RESPONSIBILITY OF THE DRAIN LAYER TO PROVIDE THE INSPECTOR WITH AN AS-BUILT DRAWING OF THE INSTALLATION, CLEARLY SHOWING THE COURSE OF THE LINE, ANY CLEAN OUTS, AND ANY OTHER PERTINENT DETAILS. NO FURTHER CONNECTION PERMIT APPLICATIONS WILL BE ACCEPTED FROM A DRAIN LAYER UNTIL THIS REQUIREMENT IS FULFILLED.

3) ALL MANHOLES MUST BE APPROVED BY THE TOWN OF READING ENGINEERING/D.P.W.

4) TYPE AND SIZE OF WATER MAIN EXTENSION: 8" D.I. CLASS 52. ALL MATERIALS TO CONFORM TO THE TOWN WATER DEPARTMENT STANDARDS.

5) TYPE AND SIZE OF WATER SERVICE PIPE: 1" NOMINAL (MINIMUM) FROM PROPERTY LINE TO FOUNDATION. ALL MATERIALS TO CONFORM TO THE TOWN WATER DEPARTMENT STANDARDS.

6) JOINTS MUST BE WATERTIGHT. COMPRESSION GASKETS TO BE WIPED CLEAN AND LUBRICATED IMMEDIATELY PRIOR TO CONNECTION.

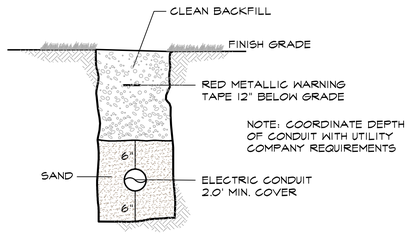
7) LINES SHALL BE LAID AS STRAIGHT AS POSSIBLE, WITH MINIMUM BENDS.

8) BEDDING SHALL BE ADEQUATE TO ASSURE NO DEFORMATION OF THE PIPE AFTER BACKFILLING. MATERIAL MUST BE PROCESSED SAND OR CRUSHED STONE, NO LARGER THAN 3/4-INCH, COMPACTED TO A MINIMUM DEPTH OF 6" BELOW PIPE, AND USED AS COVER TO A MINIMUM OF 6 INCHES OVER THE PIPE.

9) THE ENTIRE LENGTH OF THE WORK INCLUDING JOINTS MUST BE INSPECTED PRIOR TO BACK FILLING.

**NOTE**

**ALL OF THE UNDERGROUND UTILITIES ARE NOT SHOWN ON THIS PLAN. CONTACT INDIVIDUAL UTILITY COMPANIES TO DETERMINE THE LOCATION OF THE LINES. BEFORE DESIGN AND CONSTRUCTION CALL "DIG SAFE" AT 1-800-DIG SAFE**




## ELECTRIC SERVICE TRENCH

NOT TO SCALE

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ASB
design group, LLC
civil engineering
traffic engineering
architecture
landscape design & construction
363 boston street, route 1
topsfield, ma 01983


project title:

ALFRED E. PETERSON WAY

prepared for:

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COMMONWEALTH OF MASSACHUSETTS
Thad D Barry
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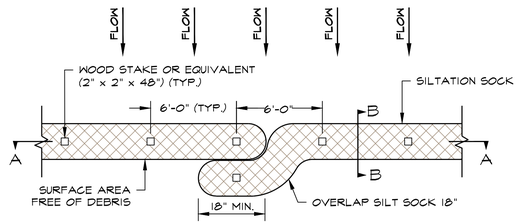
drawing name

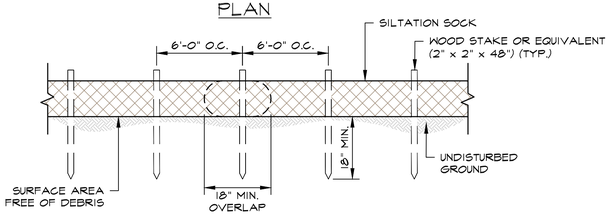
UTILITY DETAILS

drawing number

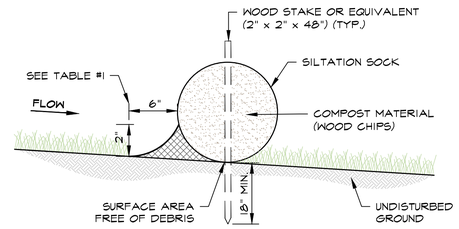
C11




PLAN




SECTION A-A




SECTION B-B

## SILTATION SOCK DETAIL

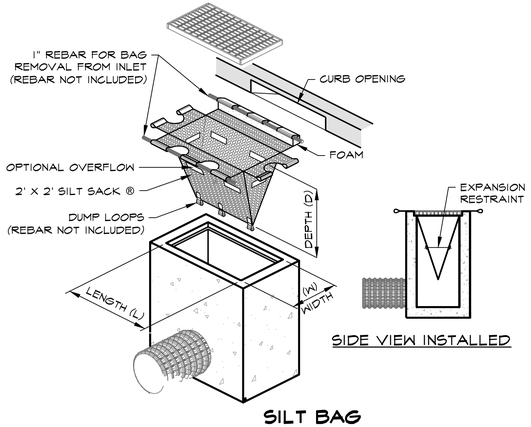
NOT TO SCALE

INSTALLATION NOTES:

1. INSTALL SILT SOCK ON A SURFACE CLEAR OF DEBRIS.
2. OVERLAP ENDS BY A MINIMUM OF 18-INCHES.
3. END OF SILT SOCK TO BE DIRECTED UP SLOPE.
4. PLACE STAKES THROUGH SILT SOCK OR ON DOWNSTREAM SIDE.
5. ON SLOPES GREATER THAN 2:1 (>2:1) SEED COMPOST SOCK IS RECOMMENDED.

| TABLE #1 | | | |
|---|---|---|---|
| SLOPE | SOCK DIAMETER (MIN.) | STAKING | 2" COMPOST BARRIER (WOOD CHIPS) |
| < 50:1 | 9" | 6' O.C. | --- |
| 50:1 TO 10:1 | 9" | 6' O.C. | --- |
| 10:1 TO 5:1 | 12" | 6' O.C. | --- |
| 5:1 TO 2:1 | 12" | 4' O.C. | --- |
| > 2:1 | 18" | 4' O.C. | RECOMMENDED |

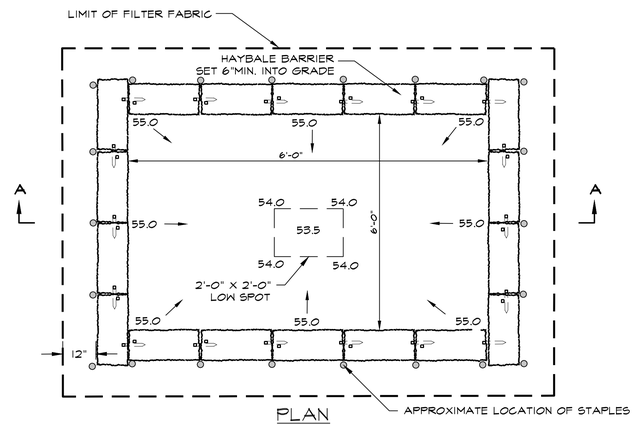
USE 9" SOCK



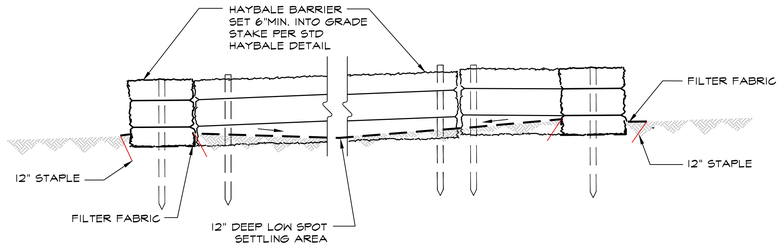

SIDE VIEW INSTALLED

## SILT BAG INLET PROTECTECTION

NOT TO SCALE




PLAN

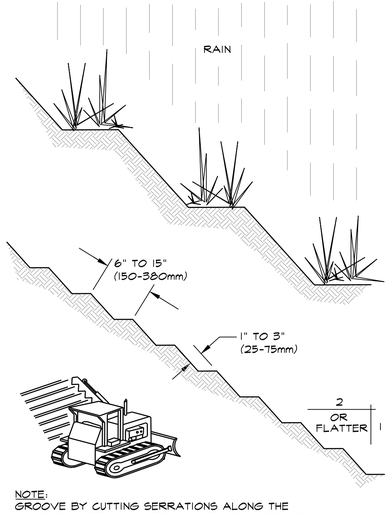



SECTION A-A

## CONCRETE WASH OUT BASIN

NOT TO SCALE

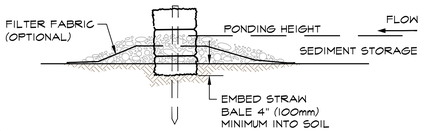
ALL CONCRETE WASTE TO BE REMOVED AND DISPOSED OF OFF SITE IN ACCORDANCE WILL ALL FEDERAL, STATE AND LOCAL RULES AND REGULATIONS



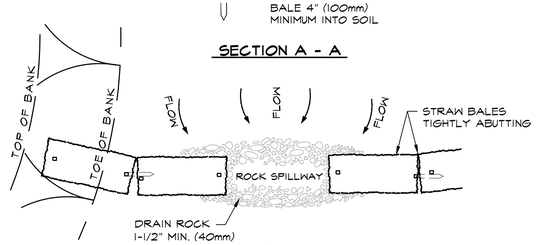

NOTE:
GROOVE BY CUTTING SERRATIONS ALONG THE CONTOUR. IRREGULARITIES IN THE SOIL SURFACE CATCH RAINWATER, SEED, MULCH AND FERTILIZER.

## GROOVED OR SERRATED SLOPE

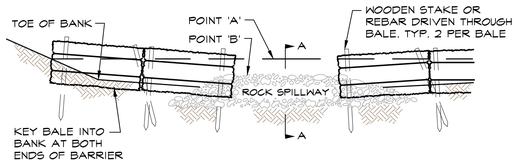
NOT TO SCALE




SECTION A - A




PLAN



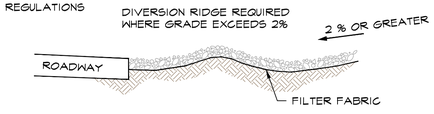

VIEW LOOKING UPSTREAM

NOTES:

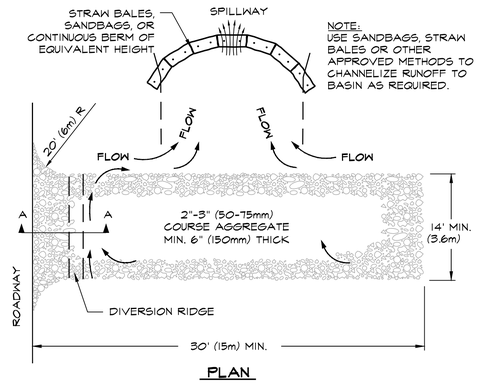
1. PLACE BALES PERPENDICULAR TO FLOW.
2. EMBED THE BALE 4" (100mm) INTO THE SOIL AND "KEY" THE END BALES INTO THE CHANNEL BANKS TO PREVENT FLOW AROUND THE BALES.
3. BALES PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING.
4. POINT "A" SHALL BE HIGHER THAN POINT "B".
5. SPILLWAY HEIGHT SHALL NOT EXCEED 24" (0.6m).

## SEMI-PERVIOUS STRAW BALE SEDIMENT BARRIER

NOT TO SCALE




SECTION A - A




PLAN

NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. ADJACENT STREETS SHALL BE SWEPT.

## TEMPORARY CONSTRUCTION ENTRANCE

NOT TO SCALE

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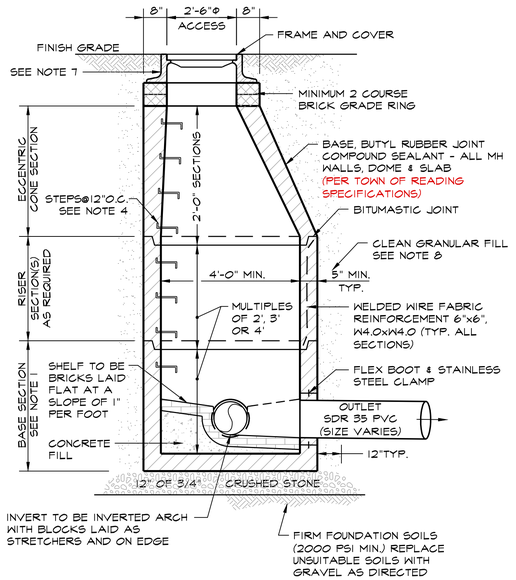
drawing name

EROSION CONTROL DETAILS

drawing number

C12

sheet 12 of 16




## PRE-CAST CONCRETE SEWER MANHOLE

NOT TO SCALE

(ALSO SEE THE TOWN OF READING SEWER STANDARDS)

SEWER MANHOLE NOTES:

1) BASE SECTION SHALL BE MONOLITHIC WITH 48-INCH INSIDE DIAMETER.

2) ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING.

3) CONCRETE SHALL BE COMPRESSIVE STRENGTH 4000psi TYPE II CEMENT. PRE-CAST REINFORCED CONCRETE SHALL BE ASTM C-478.

4) MANHOLE STEPS SHALL BE REINFORCED COPOLYMER POLYPROPYLENE M.H. STEPS INSTALLED @12'OC WITH A 6" PROJECTION (NA INDUSTRIES INC. STEP MODEL NO.PS-1-PF PR EQUAL) FOR THE FULL DEPTH OF THE STRUCTURE.

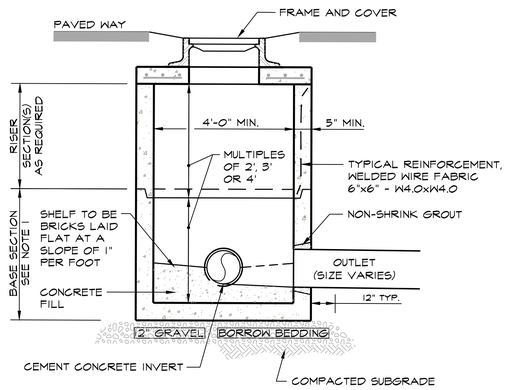
5) STANDARD SEWER MANHOLE FRAME SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 COURSE MAXIMUM).

6) FRAME AND COVER SHALL BE LABARON LA 326-1 CAST IRON OR ENGINEER APPROVED EQUAL. THE WORD "SEWER" SHALL BE CAST INTO THE COVER WITH 3-INCH LETTERS.

7) CLEAN GRANULAR FILL SHALL BE FREE FROM FROM ORGANIC MATTER, LARGE STONES, STUMPS, MASONRY, FROZEN EARTH, WOOD, TREE BRANCHES & WASTE CONSTRUCTION MATERIAL. PLACE AND MECHANICALLY COMPACT IN 12" LIFTS TO 95% OF MAX. STANDARD PROCTOR COMPACTION.

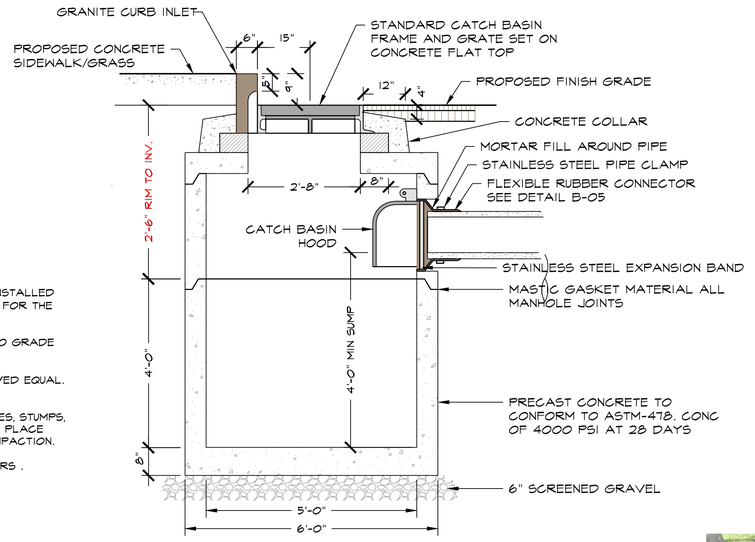
8) FOLLOWING ALL INSTALLATIONS VACUUM TEST MANHOLES AND PRESSURE TEST SEWERS .

9) TRENCH SHEETING & BRACING TO BE SUPPLIED AS REQUIRED.

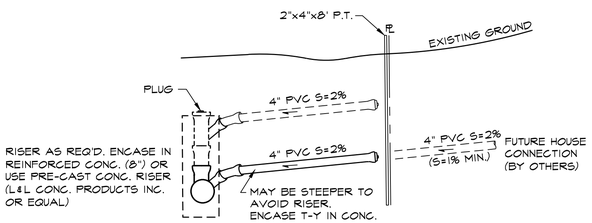



## FLAT TOP DRAIN MANHOLE

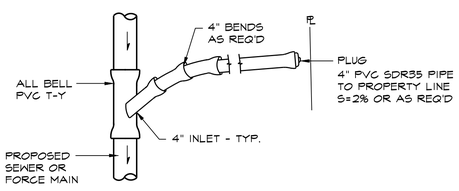
NOT TO SCALE




## SHALLOW CATCH BASIN



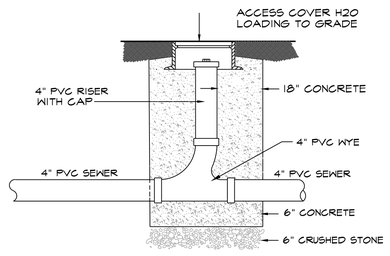

## PROFILE




## PLAN

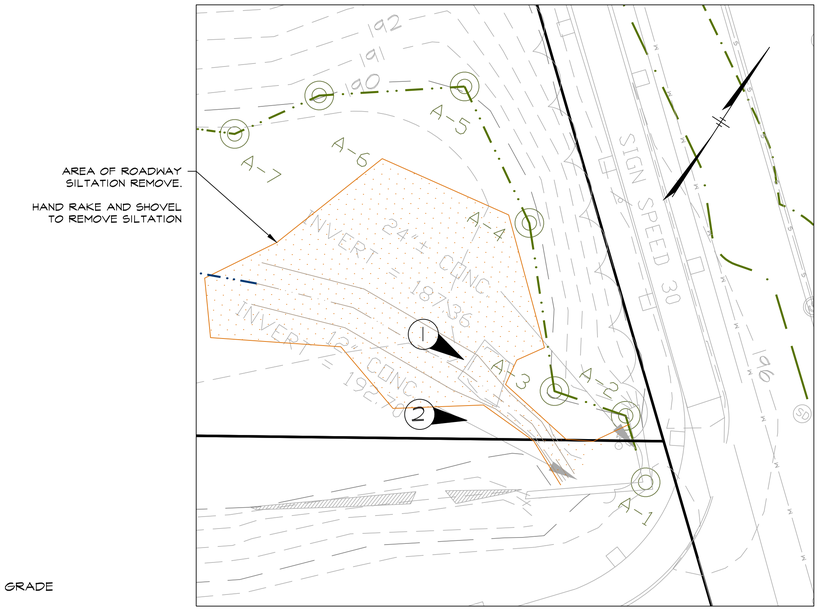
## LATERAL SEWER CONNECTION

NOT TO SCALE



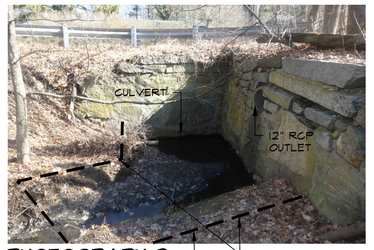

## SEWER CLEANOUT - LOT 2

NOT TO SCALE





PHOTOGRAPH 1




PHOTOGRAPH 2

NOTE 1:

- HAND EXCAVATE SEDIMENTATION FORBAY.
- PLACE 24" BOULDERS ON SIDE WALLS.
- PLACE RIP RAP IN SEDIMENTATION BASIN.
- INSTALL CONCRETE CURB WIER OVER FLOW/VELOICTY REDUCER.

LOCATION OF PHOTOGRAPH

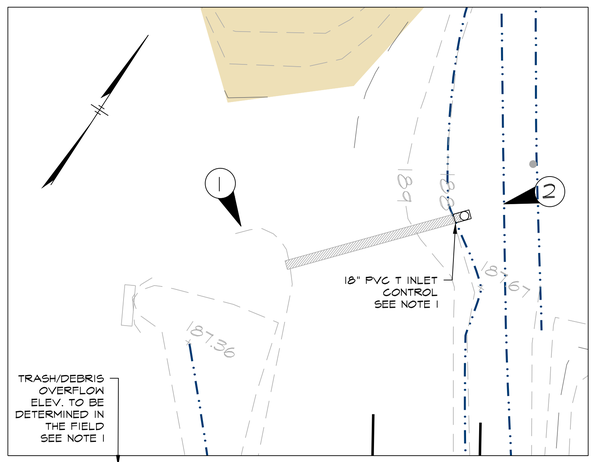
## ROADWAY CULVERT DETAIL

SCALE: 1"=10'

WATER ELEVATION 188.50

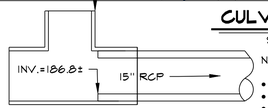

PHOTOGRAPH 1


PHOTOGRAPH 2




## CULVERT DETAIL

SCALE: 1"=10'




NOTE 1:

- HAND EXCAVATE AND UNCLOG INLET AND OUTLET.
- INSTALL 18" PVC T INLET CONTROL.
- AT TIME OF INSTALLATION DETERMINE OVERFLOW ELEVATION. (MIN.=188.50) ABOVE TOP OF RCP PIPE.

## 18" PVC T INLET CONTROL

FOR REGISTRY USE ONLY

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design group, LLC
civil engineering
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landscape design & construction
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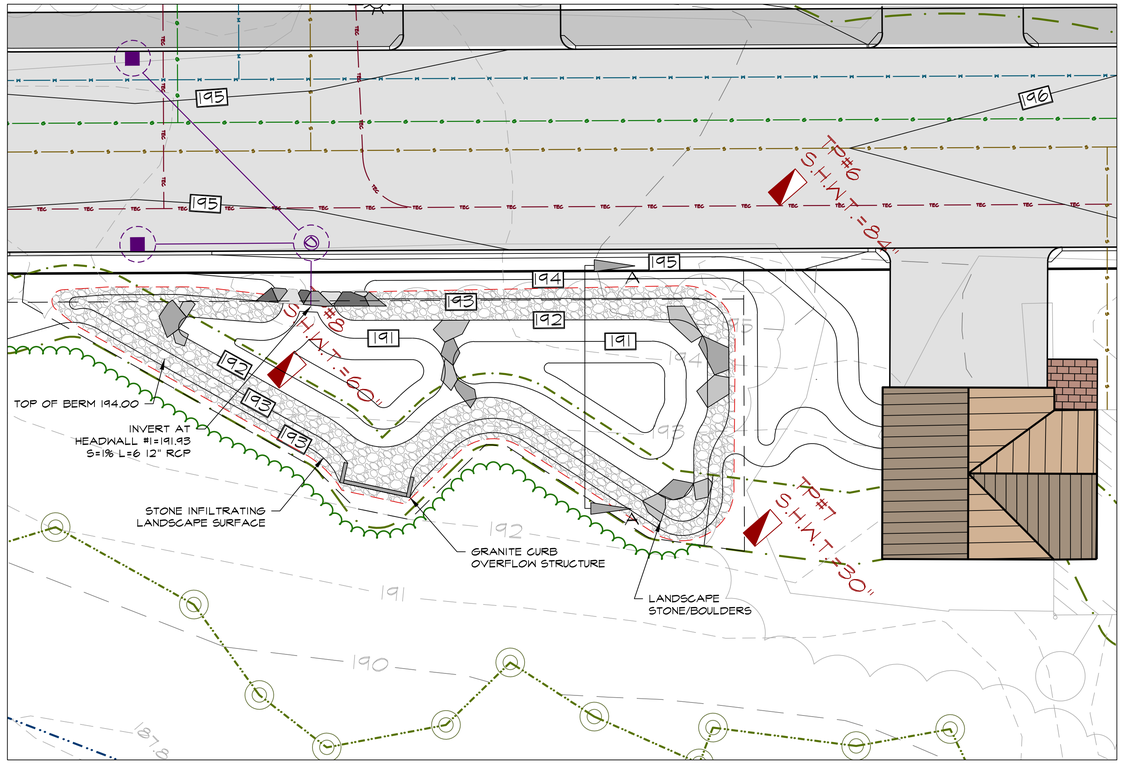
drawing name

DRAINAGE, SEWER & EROSION CONTROL DETAILS

drawing number

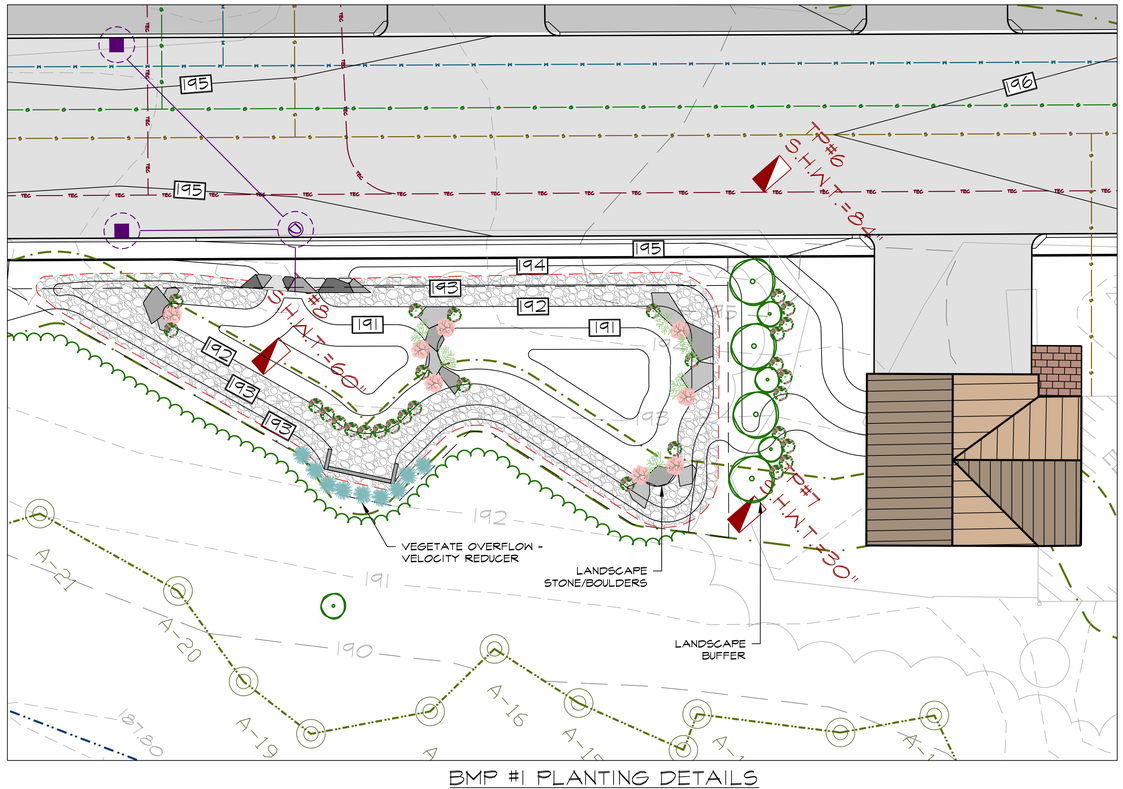
C13

sheet 13 of 16



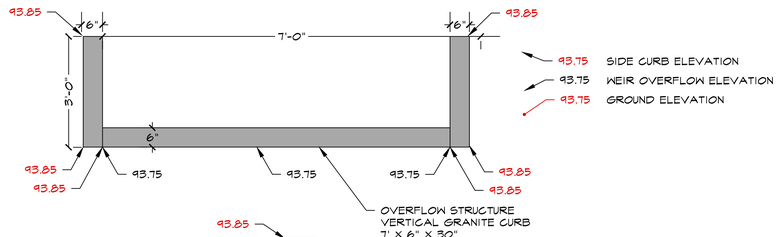

## BMP #1 LAYOUT DETAILS

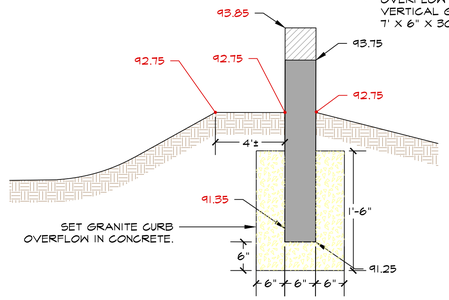
SCALE: 1"=10'




## BMP #1 PLANTING DETAILS

SCALE: 1"=10'



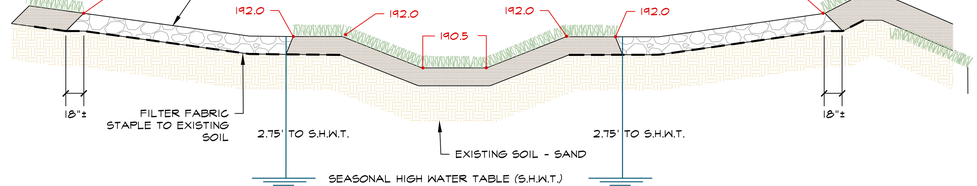

## BMP #1 GRANITE CURB OVERFLOW STRUCTURE

NOT TO SCALE

### BMP #1

### INFILTRATION FOR LID ("STATIC" METHOD)

INFILTRATION AREA = 1040 S.F.
- INFILTRATION RATE: 8.27 IN/HR (SEE SHEET C15 FOR INFILTRATION RATE)
- Q = (K) x (BOTTOM AREA BMP 1)
- Q = (8.27 IN/HR) x (1040 S.F. SYSTEM) x $\frac{(1' \times 1\ HR)}{(12'' \times 3600\ sec)}$
- Q = 0.199 cfs ≈ 0.20 cfs

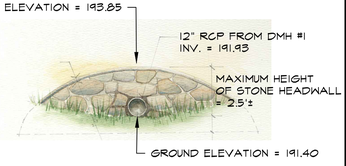



## BMP #1 CROSS SECTION A-A

NOT TO SCALE

A - BOULDER BUFFER PLANTINGS

BMP #1 INFILTRATION LANDSCAPE SURFACE




## BMP #1 STONE HEADWALL #1

NOT TO SCALE

B - BOULDER BUFFER PLANTINGS

BMP #1 BOULDER STONE INTERFACE
AT INFILTRATION CHANNEL

## BOULDER LANDSCAPE PLANTING (OPTIONS TYP.)
## A AND B - BMP #1

FINAL PLANTING FOR BMP1 TO BE COORDINATED WITH CONTRACTOR AND WETLANDS AND LAND MANAGEMENT INC. AFTER PLACEMENT OF BINDER PAVEMENT. ALL SILTATION SHALL BE REMOVED FROM BMP1 AND FINAL EXCAVATION SHALL TAKE PLACE. PRIOR TO PLACEMENT OF LOAM, SEED, LANDSCAPE INFILTRATION SURFACE, PLANTS AND LANDSCAPE BOULDERS CONTRACTOR SHALL HAVE SURVEYOR CONFIRM AS-BUILT CONDITIONS.

SCALE BAR 0 20' 40' 60' SCALE: 1"=20'

FOR REGISTRY USE ONLY

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civil engineering
traffic engineering
architecture
landscape design & construction
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CIVIL
REGISTERED PROFESSIONAL ENGINEER

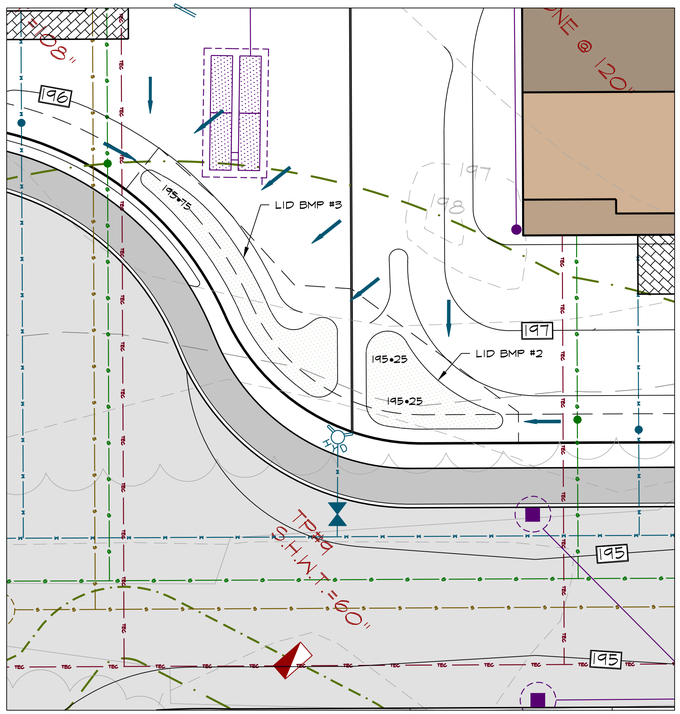
drawing name

BMP 1 DETAILS

drawing number

C14

sheet 14 of 16




LID #2 AND #3 BMP DETAIL

SCALE: 1"=10'

## LID #2 AND 3

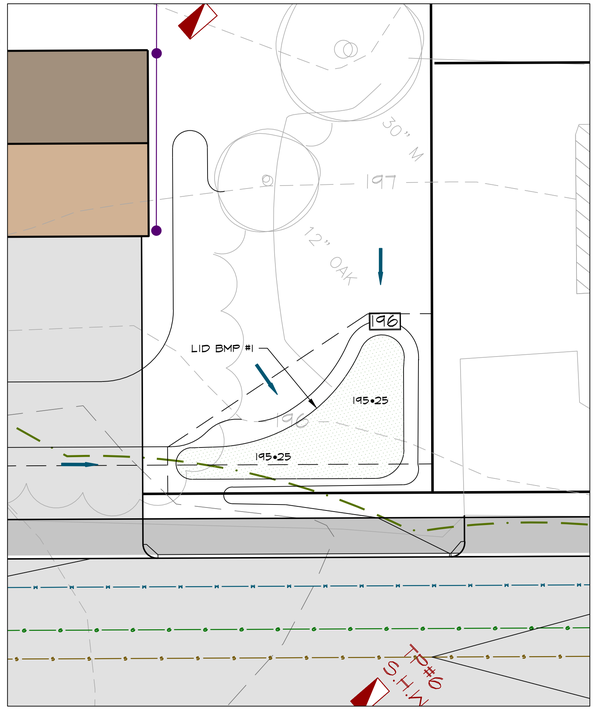
**INFILTRATION FOR LID ("STATIC" METHOD)**

LID #2 AREA = 146 S.F.
LID #3 AREA = 191 S.F.
TOTAL AREA = 337 S.F.
- INFILTRATION RATE: 8.27 IN/HR
- Q = (K) x (BOTTOM AREA LID 1)
- Q = (8.27 IN/HR) x (337 S.F. SYSTEM) x $\frac{(1' \times 1\ HR)}{(12" \times 3600\ sec)}$
- Q = 0.064 cfs ≈ 0.06 cfs

**LEGEND:**

195+50 SPOT GRADE (TYP.)

SURFACE FLOW (TYP.)




LID #1 BMP DETAIL

SCALE: 1"=10'

## LID #1

**INFILTRATION FOR LID ("STATIC" METHOD)**

LID #1 AREA = 306 S.F.
- INFILTRATION RATE: 8.27 IN/HR
- Q = (K) x (BOTTOM AREA LID 1)
- Q = (8.27 IN/HR) x (306 S.F. SYSTEM) x $\frac{(1' \times 1\ HR)}{(12" \times 3600\ sec)}$
- Q = 0.059 cfs ≈ 0.06 cfs

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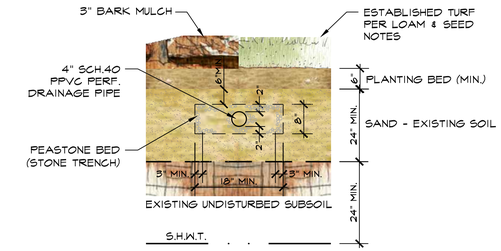
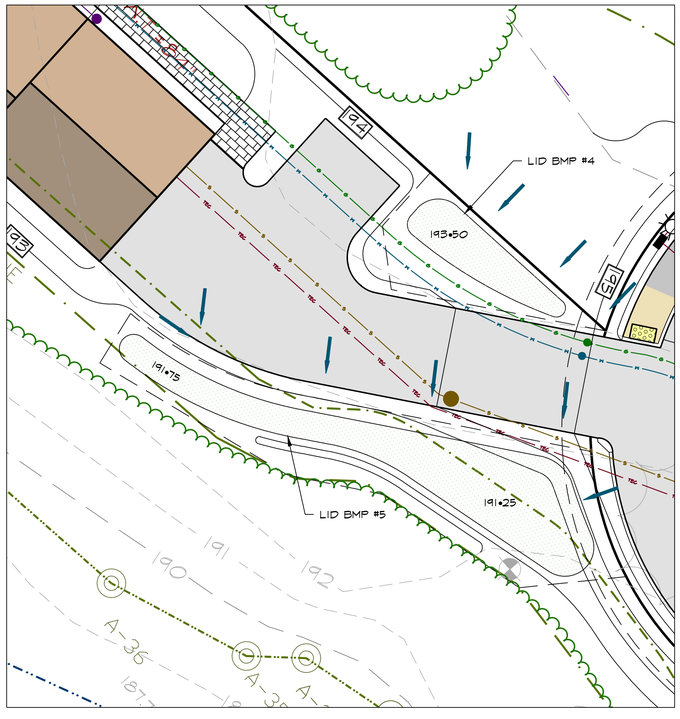
## INFILTRATION CALCULATIONS:

| TEXTURE CLASS | NRCS HYDROLOGIC SOIL GROUP (HSG) | INFILTRATION RATE (INCHES/HOUR) |
|---|---|---|
| SAND | A | 8.27 |
| LOAMY SAND | A | 2.41 |
| SANDY LOAM | B | 1.02 |
| LOAM | B | 0.52 |
| SILT LOAM | C | 0.27 |
| SANDY CLAY LOAM | C | 0.17 |
| CLAY LOAM | D | 0.09 |
| SILTY CLAY LOAM | D | 0.06 |
| SANDY CLAY | D | 0.05 |
| SILTY CLAY | D | 0.04 |
| CLAY | D | 0.02 |




**LAWN INFILTRATION DETAIL**

NOT TO SCALE



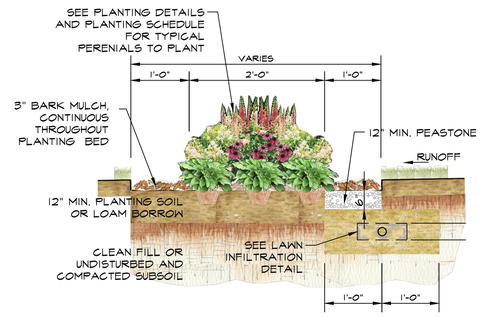

LID #4 AND #5 BMP DETAIL

SCALE: 1"=10'

## LID #4 AND 5

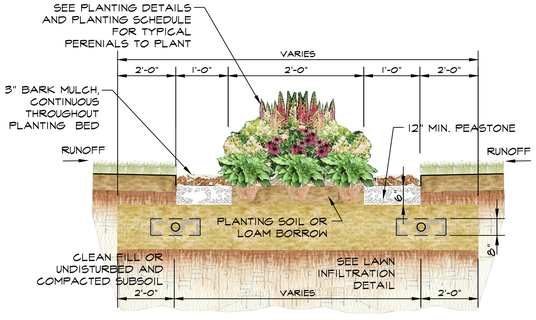
**INFILTRATION FOR LID ("STATIC" METHOD)**

LID #4 AREA = 133 S.F.
LID #5 AREA = 471 S.F.
TOTAL AREA = 604 S.F.
- INFILTRATION RATE: 8.27 IN/HR
- Q = (K) x (BOTTOM AREA LID 1)
- Q = (8.27 IN/HR) x (604 S.F. SYSTEM) x $\frac{(1' \times 1\ HR)}{(12" \times 3600\ sec)}$
- Q = 0.116 cfs ≈ 0.12 cfs




**PLANTING BED DETAIL 1 LID BMP 5**

NOT TO SCALE




**PLANTING BED DETAIL LID BMP 1-4**

NOT TO SCALE

A - LID BMP EXAMPLE 1

B - LID BMP EXAMPLE 2

**LID BMP PLANTING LAYOUT OPTIONS A AND B**

SCALE BAR 0 20' 40' 60' SCALE: 1"=20'


ASB
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civil engineering
traffic engineering
architecture
landscape design & construction
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topsfield, ma 01983


project title:

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prepared for:

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revisions

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plan submission

DEFINITIVE SUBDIVISION PLAN AND NOTICE OF INTENT

date: 04.04.2016
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job no: 2014-17
DEP no: TBD

COMMONWEALTH OF MASSACHUSETTS
Thad D Berry
No. 41258
CIVIL
REGISTERED PROFESSIONAL ENGINEER

drawing name

LID BMP 1-5 DETAILS

drawing number

C15

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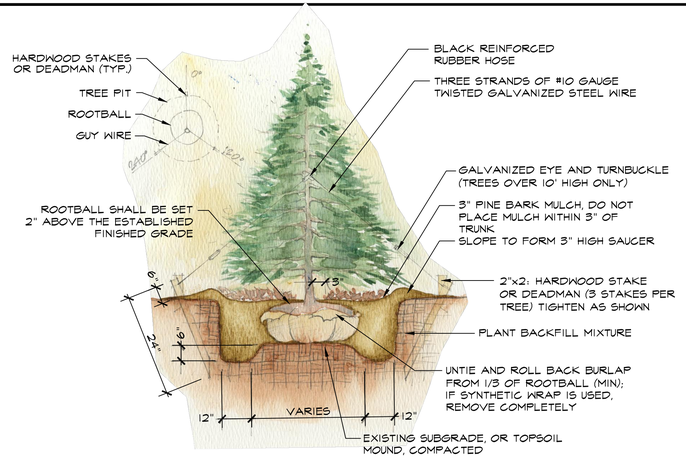
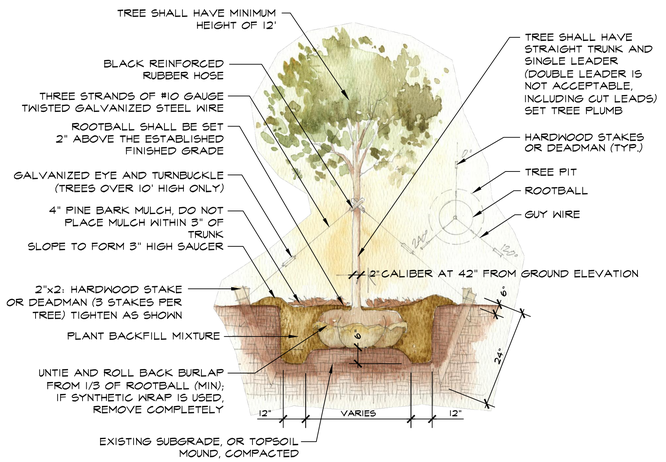


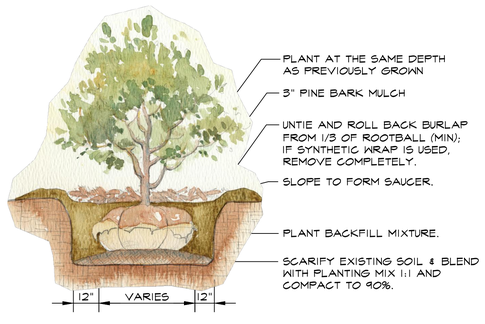

CONIFER
TREE PLANTING

NOT TO SCALE




DECIDUOUS
STREET TREE PLANTING

NOT TO SCALE




TYPICAL
SHRUB PLANTING

NOT TO SCALE

LAVENDER PROVENCE BLUE

HACKBERRY TREE
(CELTIS OCCIDENTALIS)

BUFFALO JUNIPER
(JUNIPERUS SABINA "BUFFALO")

PURPLE DOME ASTER
(ASTER NOVAE-ANGLIAE)

RIBBON GRASS
(PHALARIS ARUNDINACEA)

DWARF GOLDEN THREADLEAF
CYPRESS (SUNGOLD)

DWARF GERMANDER
(TEUCRIUM CHAMAEDRYS)

BLUE FESCUE
(FESTUCA OVINA GLAUCA)

HOLLY
(ILEX CORNUTA "CARISSA")

## DESCRIPTION

BROAD-LEAVED DECIDUOUS TREE

GROWTH:
FAST - ABOUT 2 FT/YEAR

HABITAT:
FULL SUN TO FULL SHADE
ALL SOILS

PLANTING:
2" CALIPER MINIMUM
BALLED AND BURLAPED CONTAINER
(SEE PLANTING DETAIL)

FLOWERING:
SMALL RED CLUSTERS IN SPRING

FRUITING SEASON:
NONE

MATURE HEIGHT: 40' TO 60'
MATURE SPREAD: 40' TO 60'

RED MAPLE
(acer rubrum)

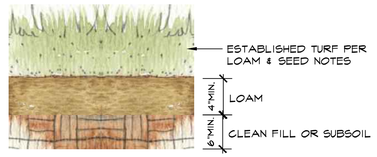
## SUGGESTED PLANTINGS LID BMP 1 - 5

FINAL PLANTING OF LID BMP'S TO BE COORDINATED IN THE FIELD WITH APPLICANT, HOMEOWNER AND WETLAND AND LAND MANAGEMENT INC.

**TYPICAL WETLAND SEED MIX**

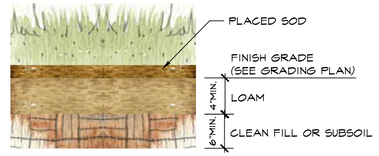
| Species | Scientific Name | approx. % |
|---|---|---|
| Shallow sedge | (*Carex lurida*) | 30 |
| Fringed sedge | (*Carex crinita*) | 30 |
| Wool grass | (*Scirpus cyperinus*) | 10 |
| Manna grass | (*Glyceria canadensis*) | 5 |
| Soft rush | (*Juncus effusus*) | 3 |
| Joe-Pye-weed | (*Eupatoriadelphus maculatus*) | 3 |
| Boneset | (*Eupatorium perfoliatum*) | 3 |
| New England aster | (*Aster novae-angliae*) | 3 |
| Blue vervain | (*Verbena hostata*) | 2 |
| Flat Top Aster | (Aster umbellatus) | 2 |
| Turtle Head | (Chelone glabra) | tr. |
| Bladder sedge | (*Carex lupulina*) | tr. |
| Meadow rue | (*Thalictrum pubescens*) | tr. |
| Steeple bush | (*Spirea tomentosa*) | tr. |
| Swamp milkweed | (*Asclepias incarnata*) | tr. |
| Blueflag Iris | (*Iris versicolor*) | tr. |

WETLAND SEED MIX



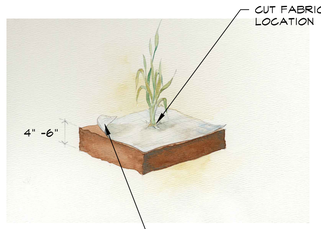

LOAM & SEED DETAIL

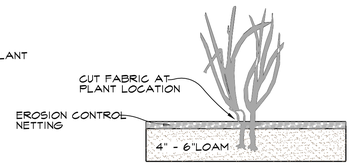
NOT TO SCALE




SOD LAWN DETAIL

NOT TO SCALE



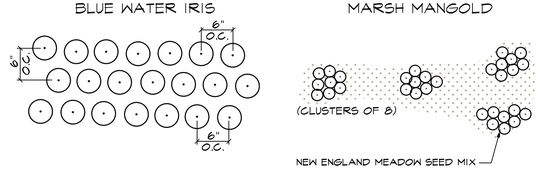




PLANTING SHALL BE DONE BY HAND USING A DIBBLE, PLANTING SPADE, OR OTHER METHOD APPROVED BY THE OWNER OR ENGINEER. THE DIBBLE OR SPADE SHALL BE USED TO CREATE A SHALLOW HOLE IN THE MOIST TOPSOIL FOR PLANTING. THE HOLE SHALL BE OF SUFFICIENT DEPTH AND WIDTH TO ALLOW THE ROOT TO BE INSERTED WITHOUT BREAKAGE OR OTHER DAMAGE. THE PLANTS SHALL BE PLANTED SO THAT THE LEAF BASES ARE AT THE SOIL SURFACE. AFTER PLACEMENT OF THE PLANT IN THE HOLE, THE HOLE SHALL BE CAREFULLY CLOSED AROUND THE PLANT ROOT BY GENTLY APPLYING PRESSURE TO THE EDGE OF THE HOLE WITH ONE'S FOOT OR OTHER METHOD APPROVED BY THE OWNER OR ENGINEER. PLANTS WHICH HAVE BEEN JUDGED BY THE OWNER OR ENGINEER TO BE DAMAGED BY MISHANDLING DURING THE PLANTING PROCESS SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

## BMP 1 BASIN PLANTING DETAIL

NOT TO SCALE

FINAL PLANTING FOR BMP1 TO BE COORDINATED WITH CONTRACTOR AND WETLANDS AND LAND MANAGEMENT INC. AFTER PLACEMENT OF BINDER PAVEMENT, ALL SILTATION SHALL BE REMOVED FROM BMP1 AND FINAL EXCAVATION SHALL TAKE PLACE. PRIOR TO PLACEMENT OF LOAM, SEED, LANDSCAPE INFILTRATION SURFACE, PLANTS AND LANDSCAPE BOULDERS CONTRACTOR SHALL HAVE SURVEYOR CONFIRM AS-BUILT CONDITIONS.




TYPICAL PLANTING LAYOUTS

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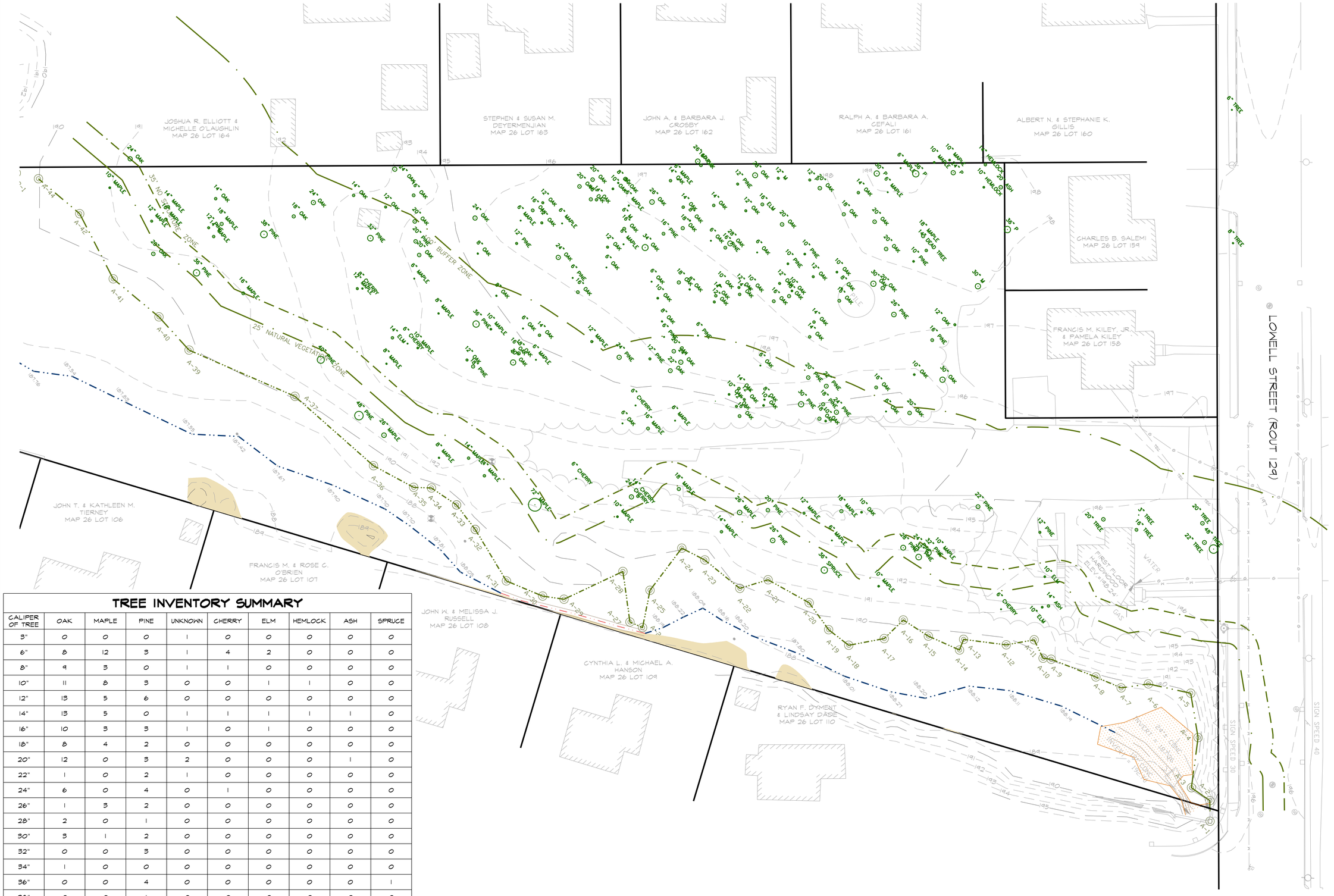
drawing name

LANDSCAPE DETAILS

drawing number

C16

sheet 16 of 16




## TREE INVENTORY SUMMARY

| CALIPER OF TREE | OAK | MAPLE | PINE | UNKNOWN | CHERRY | ELM | HEMLOCK | ASH | SPRUCE |
|---|---|---|---|---|---|---|---|---|---|
| 3" | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 6" | 8 | 12 | 3 | 1 | 4 | 2 | 0 | 0 | 0 |
| 8" | 9 | 3 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 10" | 11 | 8 | 3 | 0 | 0 | 1 | 1 | 0 | 0 |
| 12" | 13 | 5 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| 14" | 13 | 5 | 0 | 1 | 1 | 1 | 1 | 1 | 0 |
| 16" | 10 | 3 | 3 | 1 | 0 | 1 | 0 | 0 | 0 |
| 18" | 8 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20" | 12 | 0 | 3 | 2 | 0 | 0 | 0 | 1 | 0 |
| 22" | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| 24" | 6 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 0 |
| 26" | 1 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28" | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30" | 3 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 32" | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 34" | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 36" | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 |
| 38" | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 40" | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 48" | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 72" | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL | 98 | 45 | 41 | 9 | 7 | 5 | 2 | 2 | 1 |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topsfield, ma 01983


SURVEYOR


DONOHOE SURVEY, INC.
LAND SURVEYING & MAPPING
363 Boston Street, Route 1
Topsfield, MA. 01983
978-887-6101


PROJECT: 2833

project title:

# LYLE ESTATES

prepared for:

JAMIESON PROPERTIES LLC
627 MAIN STREET, SUITE 1
WOBURN, MA 01801

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drawing name

TREE INVENTORY PLAN

drawing number

T1

sheet 1 of 1